form the electrochemical cell, first making contact as shown in Fig. 6b, with individual liquid-filled holding areas on the substrate to which suspensions are confined. Overfilling ensures that contact is made with individual suspensions. The electric field is now turned on to induce array formation in the MxN holding areas and to ensure the preservation of the overall configuration of the MxN sets of beads while the gap is closed further (or filled with additional buffer) to eventually fuse individual droplets of suspension into a contiguous liquid phase as shown in Fig. 6c. In the fully assembled cell of Fig. 6c, while the droplets are fused together, the beads from each droplet are maintained in and isolated in their respective positions, reflecting the original MxN arrangement of wells. The present invention thus provides for the operations required in this implementation of a layout-preserving transfer procedure to load planar electrochemical cells.

Example V - Preparation of Heterogeneous Panels of Particles

The present invention provides a method to produce a heterogeneous panel of beads and potentially of biomolecules for presentation to analytes in an adjacent liquid. A heterogeneous panel contains particles or biomolecules which differ in the nature of the chemical or biochemical binding sites they offer to analytes in solution. In the event of binding, the analyte is identified by the coordinates of the bead, or cluster of beads, scoring positive. The present method relies on the functional elements of the invention to assemble a planar array of a multi-component mixture of beads which carry chemical labels in the form of tag molecules and may be so identified subsequent to performing the assay.

Diagnostic assays are frequently implemented in a planar format of a heterogeneous panel, composed of simple ligands, proteins and other biomolecular targets. For example, in a diagnostic test kit, a heterogeneous panel facilitates the rapid testing of a given analyte, added in solution, against an entire set of targets. Heterogeneous panels of proteins are of great current interest in connection with the emerging field of proteome research. The objective of this research is to identify, by scanning the panel with sensitive analytical techniques such as mass spectrometry, each protein in a multi-component mixture extracted from a cell and separated by two-dimensional gel electrophoresis. Ideally, the location of each spot uniquely corresponds to one particular protein. This analysis would permit, for example, the direct monitoring of gene expression levels in a cell during a particular point in its cycle or at a given stage during